

Performance of Goat Production Supply Chain Models and Institutions in South Sulawesi, Indonesia

Hastang, Syahdar Baba, Aslina Asnawi, Muhammad Ihsan Andi Dagong, Sitti Nurani Sirajuddin*
Faculty of Animal Husbandry, Hasanuddin University, Makassar 90245, South Sulawesi, Indonesia
 *corresponding Author: sitti.nurani@unhas.ac.id

Abstract This study examines the model for the goat production supply chain and institution performance in the supply chain from production centers (Jeneponto Regency) to consumption centers (Makassar City). The institutions discussed here are only institutions that are included in the chain as primary members.

The performance of goat supply chain institutions can be seen from the benefits obtained in the highest order, namely breeders, retailers, and collectors in Channel 1, while in Channel 2, they are farmers, intermediary consumers, collectors and retailers. The profit gained breeders from marketing margins in both channels is quite good; the respective values are 67.43% and 64.66% of total marketing margins.

Keywords: *livestock, supply chain management, goat production, Indonesia*

1. Introduction

Indonesia has one of the highest levels of meat consumption in the world. Meat demand in 2012 reached 549,000 tons [1], caused by Indonesia's large population (around 238 million), as well as growth in tourism and other factors. In [2] states that the livestock sector has not been able to meet this demand, so Indonesia still has to import as much as 30% of the needed livestock.

One type of livestock that can be used to support the fulfilment of the demand for meat is goats, which can be bred easily and quickly. The number of goats born per each female goat is often more than one, with a short gestational period. In addition, goats have high adaptability to a variety of agro ecosystem conditions [2]. Goats are also economic support for breeders' families, in that the goats can be used as savings [3-5]. Finally, goats have advantages on the consumer side, in which they provide not only the meat needed but also special values related to religious beliefs; for example, Muslims will purchase the goats for the requirements of aqiqah (birth celebrations), Idul Adha and others.

As goats give tremendous benefits for breeders/producers, consumers, and all supply chain institutions involved, it is, therefore, necessary to manage supply chains efficiently from upstream to downstream. The supply chain is a set of activities related to the flow of transformation of goods from the earliest stages of raw materials to the end-user, as well as the flow of money and information [6]. Supply chain management is the management of information, goods, and services ranging from the earliest suppliers to the most recent consumers by using an integrated-system approach with the same purpose [7]. The benefits of the implementation of supply chain

management include 1) the addition of value, which includes a high and sustained quality, quantity, and suitability in charging to cover production costs, 2) the reduction of transaction costs, which has an impact on the emergence of a response to the market that is more oriented to the interests of retailers, and 3) the reduction of business risks, which provides marketing guarantees tailored to technology adoption that leads to production efficiency [8].

Indonesia is one of the major producers and consumers of goat meat; Indonesia is projected to still have a surplus of goat meat through the years 2018–2021. In 2018 production was 71,892 tons and consumption 67,184 tons (a surplus of 4,708 tons). However, Indonesia still imports mutton from other countries, caused by supply chain problems [9]. Therefore, the supply chain model and performance of institutions in the goat production supply chain from the production centers to the consumption centers needs to be examined.

2 Material and Methods

This study examines the model for the goat production supply chain and institution performance in the supply chain from production centers (Jeneponto Regency) to consumption centers (Makassar City). The institutions discussed here are only institutions that are included in the chain as primary members. Primary members are parties that are directly involved in chain business activities [10]. In this study, the primary members studied include goat breeders/farmers, collectors, retail traders, intermediary consumers, and end consumers. This research used descriptive quantitative methods. This research was conducted in Jeneponto Regency, as it is one of the largest goat production centers in South Sulawesi, and Makassar City, as it is one of the biggest consumers of goat livestock in South Sulawesi. The determination of respondents was done by the snowball sampling method, which is a variation of purposive sampling [11].

A total of 60 people working as breeders, 6 as collector traders, 11 as retailers and 3 intermediary consumers were sampled. Both primary data and secondary data were used. Supply chain data collection techniques traced the movement of goats and goat products from breeders to intermediary traders, to intermediary consumers and end consumers. Furthermore, the supply chain was explored in depth by using questionnaires to obtain information needed in assessing its performance. To discuss the goat production supply chain model, descriptive analysis was used. Measurement of the performance of goat supply chain used descriptive quantitative analysis, with indicators of profit and margin distribution to all supply chain institutions involved, as well as price share (e.g., the breeders' share, profit share and cost share of marketing institutions involved).

To calculate the margin and distribution of marketing margin in the goat supply chain, the following formula was used [12]:

$$Mm = Pc - Pf; Pr = Mm - Mc; Mi = Sp - Pp$$

Note: Mm: Margin of marketing; Pc: Price at the consumer level; Pf: Prices at the farmer/breeders level; Mi: margins of Institution; Sp: Selling Price; Pp: Purchase price; Pr: Profit; Mc: Marketing costs.

Distribution of marketing margin formula:

Cost Share:

$$CSij = Cij / (Pc - Pf) \times 100\% \text{ or } CSij = Cij / Mm \times 100\%$$

Profit Share:

$$PSj = Pij / (Pc - Pf) \times 100\% \text{ or } PSj = Pij / Mm \times 100\%$$

$$Pij = SPij - BPj - Cij$$

Note: CSij: The cost share for carrying out the marketing function by the marketing agency; Cij: The cost for carrying out the marketing function by the marketing agency; PSj: The part (share) the profit of the marketing institution; Pij: The profit of the marketing institution; SPij: The selling price of the marketing institution; BPj: The purchasing price of the marketing institution.

3 Results

3.1 Goat production supply chain model from the production center to the consumption center

Fig. 1 shows the flow of goats from production centers to end consumers through two channels. There are only two channels in goat production supply chain models were found from Jeneponto Regency to Makassar.

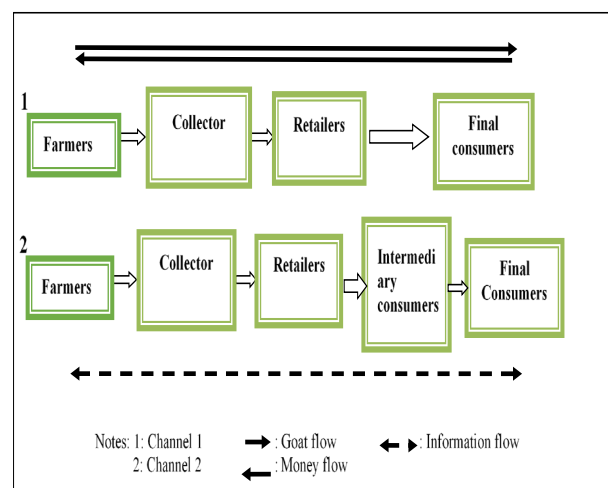


Fig. 1 Marketing channel model for the goat production supply chain from Jeneponto Regency to Makassar.

3.2 Institutional performance in goat production supply chains: Profit, margin distribution and price share

3.2.1 Benefit analysis of goat breeders

The use of inputs in goat selection is still small. This is based on the availability of the livestock owned by breeders, not based on the needs of livestock grown properly. Total revenue, total costs, added value or overall profit of the breeders (as respondents), profits per person, and the value of benefits per goat in a year can be seen in Table 1.

Table 1 Total revenue, costs and benefits of goat breeders in Jeneponto Regency

Description	Total Value (cash & non cash) (IDRs/year)	(%)	Value (cash)
Revenue (TR)			
The value of goats at the end of the year (781 head)	1,011,293,181.82	64.11	
The value of goats sold (380 head)	520,486,363.64	33.00	520,486,363.64
The value of goats consumed (17 head)	33,290,909.09	2.11	
The value of donated goats (17 head)	12,300,000.00	0.78	
Total revenue	1,577,370,454.55	100	520,486,363.64
Cost:			
Variable Cost:			
Value of goat in the beginning year (903 head)	603,450,000.00	62.03	
Cost of forage feed (Workers who take feed and take care of goat)	345,988,199.38	35.56	
Cost of additional feed (salt)	3,059,430.00	0.31	3,059,430.00
Cost of medicines	5,670,000.00	0.58	5,670,000.00
Total of Variable Cost (B1):	958,167,629.38	98.48	8,729,430.00
Fixed Cost (B2):	14,746,458.33	1.52	
Total Cost (B1+B2)	972,914,087.71	100	
Total Profit (60 breeders, cattle 1195 head)	604,456,366.84		511,756,933.64
Average profit/farmer/year (average of cattle 20 head)	10,074,272.78		8,529,282.23
Average profit/farmer/month	839,522.73		710,773.52

Average profit/head/year	505,821.23
R/C	1.62

As seen in Table 1, the total revenue of all farmer respondents was 1,577,370,454.55 IDR/year, calculated from the value of goats at the end of the year, the value of goats sold, the value of goats consumed, and the value of donated goats. The costs incurred consist of fixed costs and variable costs, with a total cost of 972,914,087.71 IDR/year. Thus, the profits obtained by all farmers were 604,456,366.84 IDR/year.

The average profit obtained by each farmer, who have on average a business scale of 20 goats is 10,074,273 IDR/year or 839,523 rupiahs/month, and thus the average profit of farmers per goat livestock raised is 505,821.23 IDR/year. The R/C value shows the comparison between the total Revenue value and the total cost value. If the R / C value > 1 then the business effort is said to be feasible. Here, the value of R/C = 1.62, which is >1, implying that every 1,000 IDR expenditure will receive 1,620 IDR back. This indicates that the livestock business is feasible. The overall advantage that the breeders get from the goat maintenance business is low, however, because the maintenance is still

done in a traditional way or the business pattern is not commercial.

3.3 Analysis of costs, margins, and benefits of channel 1 goat marketing institutions

Collectors are goat traders who buy goats from breeders then sell them to retailers in the city of Makassar. Table 2 showed the price, margin, profit, margin distribution and share of goat prices in marketing institutions in channels 1 and 2. Table 2 shows that collectors collect goats at an average price of 1,050,586.95 IDR/head. The average selling price of goats at the level of collectors, which is 1,262,695 IDR/head. The percentage of profits obtained by the collectors is 11.66% of the sales value, which means that each goat sale will bring 11.66% profit. The R/C ratio obtained by the collecting trader is 1.13, which means that the expenditure of 1.00 IDR will be revenue from the business of 1.13 IDR. The R/C ratio = 1.13 > 1 indicates that the business carried out by the collecting trader is financially feasible to run.

Table 2 Price, margin, profit, margin distribution and share of goat prices in marketing institutions in channels 1 and 2

Description	Goat Marketing Institutions			Intermediary consumer
	Breeders	Collector Trader	Retailer	
Channel 1				
Buying price (IDRs /head)		1,050,586.95	1,262,694.91	
Selling price (IDRs /head)	1,050,586.95	1,262,694.91	1,545,818.06	
Margin (IDRs /head)		212,107.95	283,123.16	
Cost (IDRs /head)		64,936.32	96,374.19	
Profit (IDRs /head)	505,821.23	147,171.63	186,748.97	
R/C	1.62	1.13	1.14	
Percentage of profit from selling price (%)	48.15	11.66	12.08	
Distribution of marketing margin:				
Profit of marketing institution (%)		29.72	37.71	
Cost of marketing institution (%)		13.11	19.46	
Share of retailer price:				
Farmer's share (%)		67.96		
Profit of marketing institution (%)		9.52	12.08	
Cost of marketing institution (%)		4.20	6.23	
Channel 2				
Buying price (IDRs/head)		1,388,102.23	1,600,210.18	
Selling price (IDRs/head)	1,388,102.23	1,600,210.18	1,833,333.33	
Margin (IDRs/head)		212,107.95	233,123.15	666,666.67
Cost (IDRs/head)		64,936.32	96,374.19	231,667.67
Profit (IDRs/head)	505,821.23	147,171.63	136,748.96	435,000.00
R/C	1.62	1.10	1.08	1.21
Percentage of profit from selling price (%)	36.44	9.20	7.46	17.40

Distribution of marketing Margin:	-		
Profit of marketing institution (%)	13.24	12.30	39.12
b. Cost of marketing institution (%)	5.84	8.67	20.84
Share of retailer price:			
a. Farmer's share (%)	55.52		
Profit of marketing institution (%)	5.89	5.47	17.40
c. Cost of marketing institution (%)	2.60	3.85	9.27

4 Discussion

4.1 Goat production supply chain model from the production center to the consumption centre

The research of [13] shows that the supply chain model for goat production in the Alaba District of Southern Ethiopia consists of five channels, while [14] show that in Tegal Regency, Indonesia, there are five channels in goat and sheep production supply chain models. However, in this study, only two channels in goat production supply chain models were found from Jeneponto Regency to Makassar.

Channels 1 and 2 have the same institution, starting from the Farmers, Collector to the retailers. The differences between them are only for buyers at retailers. Those who buy the livestock to be consumed at a family event are called the end consumers (Channel 1), and those who buy the livestock to be processed and then resold are called intermediary consumers (Channel 2). Intermediary consumers who were encountered during the study were involved in catering. The goat marketing channel here was much shorter compared to the results of [15]: "the marketing of goat and sheep livestock in Tegal Regency, involved quite a number of supply chains: village traders, market brokers, collector brokers, provincial traders, and satay traders." Likewise, [16] reported that goat production supply chains involve quite a number of key players, namely goat farmers, goat agents or seekers, wholesalers, meat sellers/traders, institutional buyers and individual customers.

The flow of money in the goat supply chain follows the pattern of goods flow but moves from downstream to upstream. The flow of money in general starts from the end consumer, to the consumer intermediary, goat retailer, then the farmers. This is in accordance with [17], who posit that money enters the supply chain only when the ultimate customer buys a product or service. Transactions in the supply chain only allocate primary customer money among chain members.

The smooth flow of money from consumers to farmers can be seen from the payment system at each level of the institution/trader. The payment system for each level of supply chain institutions varies. The final consumer and consumer payment system between retailers is cash. The payment system for retailers to collectors is neither cash nor credit. This is often the complaint of the collector because sometimes the receivables are piled on the retailer. There are even some retailers who run away without paying debt to the collector. The payment system for collecting traders to farmers is cash and there are those who do not use cash depending on the agreement. However, most of the cash generated is because most farmers sell their goats when they need cash. Breeder payment systems and traders to service providers and production facilities (secondary

members) are done in cash. Purchasing additional food, medicines for goats, payment of goat transportation services by traders are all done in cash as well. This shows that there are problems with the movement of money from downstream to upstream, that is, at the level of retailers to collectors.

4.2 Information flow in the goat production supply chain

Information from downstream to upstream does not run smoothly. Information occurs only between the traders and retailers related to the number of requests and offers of goats. This is because the running supply chain model is still traditional. According to [18], information sharing is an effective way to reduce the effect of a bullwhip, namely, the variability of demand is greater closer to upstream or far from the end customer. The effect of the bullwhip is caused by a lack of coordination between members in the supply chain, where each operates independently and thinks to maximize its own profits [19]. The principle of supply chain management is to implement a system of integration, transparency, and fairness among all the institutions involved. To facilitate the supply chain, intensive and efficient coordination is needed that involves all supply chain stakeholders so that the barriers that exist for each stakeholder can be discussed, and a shared solution sought [20-25].

4.3 Institutional performance in goat production supply chains: Profit, margin distribution and price share

4.3.1 Benefit analysis of goat breeders

The livestock business is a process of combining production factors in the form of land, livestock, labour, and capital to produce livestock products [26]. The success of the livestock business depends on three elements: seed, feed, and management. Management includes the management of feeding, housing, and animal health. Management also includes handling livestock yields, marketing, and labour arrangements.

The profit obtained by the breeders from their livestock business is calculated from the reduction in the total revenue and the total cost. The value of the product produced is calculated from the value of livestock at the end of the year, the value of livestock sold, the value of livestock consumed, and the value of livestock donated. The input value is calculated from the value of livestock at the beginning of the year, the variable input value (cash and noncash) and the fixed costs. The variable inputs include forage feed, salt (there are breeders who provide this and some who do not), and medicines and vaccines (optional). The method of calculating forage feed costs is obtained from the time that the family of the workforce takes to

acquire forage and/or deliver as well as pick up the animals grazing. According to [27], labour wages are adjusted to the length of time devoted to work. Furthermore, [28] argues that the determination of the percentage on the size of the workforce's role in people's livestock business is difficult to determine. Therefore, the wages of workers are assessed by the price of shadow prices or assumptions and not by the real prices. Fixed costs include depreciation of cages and equipment.

The results of this study consistent with the results of [29], who found that goats that are traditionally maintained with poor input-supply will have lower productivity. According to [3], livestock businesses that are managed commercially through changes from traditional maintenance patterns to modern business systems can increase income. Similarly, [13] stated that increasing partnership among entrepreneurs and breeders, incorporating a package of technological innovations, and changing business patterns can increase income.

Table 1 shows that most value of the breeders' income is still in the form of non-cash (year-end value of livestock), which is considered as savings of 1,011,293,181.82 IDR/year (64.11%). This livestock can be sold at any time if the breeders need cash. There were only 33% of cash receipts from the sale of goat livestock, as well as 2.11% of the value of non-cash receipts from goats, which are consumed at family events and Qurban (eid). This shows that goats kept by the community are not solely for the purpose of commercial business (seeking maximum profits) but are closely related to the economic security aspects of the family (savings), social aspects and religion. This is in line with the results of the research of [17, 19], who found that small breeders sell goats and sheep to meet urgent cash needs, especially to buy food.

Breeders sell their livestock at various age levels and sizes. Pricing is based on the consideration of physical appearance (not weight) and sex. The price difference between male and female goats is around 100,000 IDR/head at the same size. The pricing is set through negotiations among breeders (sellers) and buyers (traders). There are no definite standard prices. Breeders sell their livestock in their cages when the collectors come around looking for goats, or when the breeders call the goat traders to come to buy their goats. However, the transactions do not often occur immediately if there is no price agreement. This is in accordance with the results of [17], who stated that breeders market their livestock of different ages, genders, and sizes at the gates of their farms. The determination of the price of livestock is done by negotiating prices one by one.

4.4 Analysis of costs, margins, and benefits of channel 1 goat marketing institutions

Goat marketing agencies in Channel 1 are breeders, collectors, retailers. Breeders have been discussed in the previous section. Therefore, the following part will discuss collectors and retailers.

4.4.1 Goat collectors in channel 1

The determination of goat prices is based on the bargaining process among collectors and breeders. Some of the collectors (50%) state that sometimes no agreement of the price is achieved at the time of the first negotiation.

However, breeders sometimes delay their price decisions in order to compare prices offered by other collectors because there are quite a lot of collectors in the area.

The costs incurred by the collectors beside the purchase price of the goats are the pre-transaction costs and the operational costs of purchasing goats, which are 13,492 IDR/head (21%); the variable costs during the shelter (after being purchased until resold), 26,353 IDR/head (41%); fixed costs, which are 3,342 IDR/head (5%); and marketing costs to the city of Makassar, which are 21,301 IDR/head (33%).

The number of pre-transaction costs and the operational costs of purchase can be saved if there has been an integration or cooperation among collectors and breeders, so that collectors do not need to go around the village or even across to other villages to look for goats, without any clear certainty on the availability of goats to be purchased. This is consistent with the results of [24], who found that the pre-transaction fee for collecting traders is around 11% of the total costs incurred, which can be minimized if there is integration or collaboration between collectors and breeders. Likewise, maintenance costs during the shelter of the goats can be saved if there has been a clear collaboration among traders and retailers. The duration of the goats' shelter is not clear, because it depends on the demand from the retailers and local consumers in the city of Makassar and other areas.

The selling price varies depending on the size of the goat and the bargaining power (bargaining position) among the collectors and retailers in Makassar City (the buyer). The average margin of the collectors is 212,108 IDR/head and the profit is 147,172 IDR/head. The margin obtained by collectors varies, ranging from 100,000 to 400,000 IDR/head. This variation is caused by differences in the size of the goats. Large goats tend to have a bigger margin.

4.4.2 Goat retailers in marketing channels 1

The goat retailers referred to here are the traders who buy goats from the collectors who bring goats to the city of Makassar. The retailers sell them to the end consumers in Makassar City. Goats sold are live goats, although sometimes there are end customers who ask the retailers to slaughter the goats. In Makassar, there is no centralized goat slaughterhouse. Goats that are directly sold in the form of meat are goats that the traders must slaughter because they are sick; thus, being sold in the form of meat results in a much lower price compared to the sale of live goats.

Table 2 shows that the average purchasing price of goats by retailers is 1,262,695 IDR/head. The determination of the purchasing price by retailers is based on physical considerations such as the size of the goat and the bargaining among collectors and retailers. The costs incurred by retailers are relatively high, at an average of 96,375 IDR/head, which includes pre-transaction and purchase costs (4,878 IDR/head), variable costs during shelter (46,469 IDR/head), fixed costs (13,234 IDR/head), and sales costs (31,793 IDR/head). The biggest cost is the variable cost during the shelter. The number of variable costs is caused by labor costs and fuel costs in providing goat feed from various places/sources. The goat feed is in the form of corn husks from traditional markets, banana peels from vendors of processed bananas, forage from the empty fields and roadsides. The smallest

cost is on the purchasing cost because most collectors get the goats from the sales location, in other words, retailers only bear the cost of telephone calls to order the goats. The cost of transporting goats from the area is covered by collectors.

Retailers sell goats at an average price of 1,545,818 IDR/head. The selling price determination method is based on the physical consideration of the size of the goats and negotiations among retailers and buyers/consumers. Negotiations are sometimes very difficult because there are some buyers who tend to bargain strongly so that the prices can sometimes go down to around 100,000 IDR/head below the price mentioned by the seller. The results of interviews with goat retailers show that they have to raise the prices by around 100,000 IDR/head above the estimated price of the sales price. The raised price is aimed to meet buyers' demand for negotiating price reductions. For consumers who are not strong enough to negotiate, they will get a higher price than the strong negotiators. The average margin obtained by retailers on this channel is 283,123 IDR/head (range of 150,000 rupiahs until 500,000 IDR/head), and the average profit is 186,749 IDR/head. The amount of margin set by the collectors or retailers depends on the size of the goat. Large goats have greater margins than small goats.

The percentage of profits obtained by retailers from the selling price is 12.08%, which means that each goat's sale will bring a profit of 12.08%. The R/C ratio obtained by the retailer is 1.14, which means that the expenditure of 1.00 IDR will bring 1.14 IDR from the business. The R/C ratio of 1.14 is >1 indicates that the business carried out by traders between regions is financially feasible to run.

4.4.3 The analysis of margin distribution of goat marketing and share (price share) in Channel 1

Table 2 shows that marketing margins, often referred to as total margins, in Channel 1 are 495,231 IDR/head. The marketing margin covers the total marketing costs and profits from marketing institution in the channel. Distribution of marketing margins was in the form of profits of 67.43% and the remaining 32.57% in the form of costs incurred by marketing institutions (traders and retailers) on Channel 1.

Price share is a part of the retail price received or paid by the marketing chain/institution [14]. The farmer's share is the percentage of the comparison among prices at the level of breeders and retail prices at the level of consumers. Table 2 shows that breeders obtain the largest share value (farmer's share) from the total price of goats paid by consumers, which is 67.96%. The share of profits received by collecting traders is 9.52%, smaller than the share of profits received by retailers, which is 12.08%. Meanwhile, the share of costs incurred by the collecting traders (4.20%) is smaller than the share of the costs incurred by retailers (6.23%). The size of the farmer's share is still low compared to that found by [9], where the farmer's share for female goats was 80.21% and male goats 80.85%. A similar situation also happened with the breeder's share for other livestock; for example, the farmer's share of beef cattle was above 80%. As stated by [13], the farmer's share of beef cattle is above 84%. In [10] found the farmer's share is 80.56%. That is because the marketing margins taken by marketing institutions involved are quite large. Therefore,

it can be concluded that the breeder's share of goat breeders in the research location is still low and still needs to be improved because breeders need a long time to raise the goats compared to the marketing institutions. One of the ways to improve this is to reduce marketing margins. Decreasing marketing margins can be done by streamlining costs and/or reducing the profits of marketing institutions.

4.4.4 Margin, profit, margin distribution and share of goat prices in Channel 2

The goat marketing institutions in Channel 2 are almost the same as Channel 1. There are also breeders and collectors involved in marketing channel 2. What makes it different is the retailers in the city of Makassar. Besides selling the goats to the end consumers, some retailers also sell the goats to the intermediary consumers (catering) who later on resell the cattle to the end consumers (consumption on certain occasions). The live-goat retailers sell the goats to the intermediary consumers at a lower price compared to a sale to the end consumer. In general, the intermediary consumers often buy the goats at certain retailers. The price difference is around 50,000 IDR/head.

Intermediary consumers purchase goats if there is an order from an end customer for goat dishes. The goats purchased by the intermediary consumers are medium-sized goats with an average price of 1,833,333 IDR/head. The goats are then processed into certain types of cuisine according to the customers' desires (the most common type of cuisine is goat curry). The processed products are sold at the price of 2,500,000 IDR/head of processed products. Thus, the intermediary consumers' margin is 666,667 IDR/head. The costs calculated here are only additional variable costs for goat dishes, namely: the cost of seasonings other ingredients, and gas, which is an average of 231,666.67 rupiahs. Thus, the value of gross profits obtained by the intermediary consumers from the results of processing goat dishes is 435,000 IDR/head. Catering benefits are higher than the previous goat marketing agency because it does not include labor costs and other fixed costs. Labor costs and other fixed costs are rather difficult to calculate because the supply of goat dishes is usually accompanied by other types of dishes that are not accounted for here.

Apart from this model, there are also goat retailers who provide goat processing services into cooking. This is done based on the consumers' demand. Consumers buy goats according to the desired size and price, and then, they ask the goats to be cooked. Consumers who request services to be deployed will be charged by additional payments of 350,000 IDR/head. The retailers' costs for seasoning, other ingredients, and gas are around 200,000 rupiahs. Thus, the additional profits obtained by retailers from cooking services are around 150,000 IDR/head.

5 Conclusions

The performance of goat supply chain institutions can be seen from the benefits obtained in the highest order, namely breeders, retailers, and collectors in Channel 1, while in Channel 2, they are farmers, intermediary consumers, collectors and retailers. The profit gained breeders from marketing margins in both channels is quite

good; the respective values are 67.43% and 64.66% of total marketing margins. Business in all marketing institutions shows results that are feasible, i.e. R/C ratios > 1, including breeders, collectors, and retailers of goats.

References

- [1] Abidin, A., and Simanjuntak, D. (1993) Beef cattle. Directorate General of Animal Husbandry, Jakarta. (In Indonesia).
- [2] Ballou, R. H. (2004) Business logistic/supply chain management: planning, organizing, and controlling the supply chain. Prentice Hall, New Jersey.
- [3] Bashir, B. P., and Venkatachalapathy, R. T. (2017) 'Study on supply chains of goats in Northern Kerala', *Advances in Animal and Veterinary Sciences*, Vol. 5 No. 10, pp. 395-399.
- [4] Budiarsana, I. G. M., Wibowo, B., and Priyanto, D. (2016) 'Productivity and supply chain of goat and sheep livestock (KADO) case studies in Tegal district', *Jurnal Ilmu Ternak*, Vol. 16 No. 2, pp. 35-42. (In Indonesia).
- [5] Burt, D. N., Dobler, D. W., and Starling, S. L. (2004) *World class supply management: The key to supply chain management*. McGraw-Hill Companies, New York.
- [6] Chopra, S., and Meindl, P. (2007) *Supply chain management: Strategy, planning and operation*. Pearson Prentice Hall publisher, New Jersey.
- [7] Daymon, C., and Holloway, I. (2008) *Qualitative research methods in public relations and marketing communications*. Routledge, London.
- [8] Emhar, A., Aji, J. M. M., and Agustina, T. (2014) 'Beef supply chain analysis in Jember regency', *Jurnal Berkala Ilmiah Pertanian*, Vol. 1 No. 3, pp. 53-61. (In Indonesia).
- [9] Gunawan, D. P., and Affandhy, L. (1998) *Bali cattle: Potential for productivity and economic value*. Kanisius, Yogyakarta. (In Indonesia).
- [10] Hastang. (2014) *Supply chain of beef cattle at smallholder farms-based*. Dissertation for the Doctoral Degree. Hasanuddin University, Makassar, Indonesia (In Indonesia).
- [11] Lee, H. L., Padmanabhan, V., and Whang, S. (1997) 'Information distortion in a supply chain: The bullwhip effect', *Management Science*, Vol. 43 No. 4, pp. 546-558.
- [12] Legese, G., Haile, A., Duncan, A. J., Dessie, T., Gizaw, S., and Rischkowsky, B. (2019) *Sheep and goat value chains in Ethiopia: A synthesis of opportunities and constraint 2014*. <https://cgspace.cgiar.org/handle/10568/42181>. (Accessed Nov. 2019).
- [13] Ministry of Agriculture Republic of Indonesia. *Outlook lamb 2017*. (2017). <http://epublikasi.setjen.pertanian.go.id/arsip-outlook/70-outlook-peternakan/540-outlook-kambing-2017>. (Accessed November 12, 2019). (In Indonesia).
- [14] Porciuncula, F. L., and Padilla, J. N. (2017) 'Fresh goat meat (Chevon) in the market: Tracing and understanding the supply chain in Central Luzon Region, Philippines', *International Journal Agricultural Technology*, Vol. 13 No. 5, pp. 625-650.
- [15] Pujawan, I. N. (2005) *Supply chain management*. Penerbit Guna Widya, Surabaya. (In Indonesia).
- [16] Rahim, and Hastuti, D. R. D. (2008) *Agricultural economics: Introduction to theory and cases*. Penerbit Penebar Swadaya, Jakarta. (In Indonesia).
- [17] Rindayati, W., and Cyrilla, L. (2010) 'Analysis of marketing efficiency of Madura beef cattle in Pamekasan regency', *Jurnal Media Peternakan*, Vol. 24 No. 1, pp. 81-86. (In Indonesia).
- [18] Said, A. I. (2006) *Productivity and efficiency using supply chain management*. Penerbit PPM, Jakarta.
- [19] Saleh. E., Yunilas, and Sofyan, Y. H. (2006) 'Analysis of beef cattle breeder income in Hamparan Perak District of Deli Serdang', *Jurnal Agribisnis Peternakan*, Vol. 2 No. 1, pp. 36-42. (In Indonesia).
- [20] Saptana, and Daryanto, A. (2012) *Supply chain magement through partnership strategys in the Broiler industry*. In: Lokollo E M, eds. *Bunga Rampai Rantai supply chain of Indonesian agricultural commudities*. IPB Press, Bogor. (In Indonesia).
- [21] Setiawan, A. S. (2009) *Study on improving the performance of selected highland vegetable supply chain management in West Java*. Unpublished Master Thesis, Bogor Agricultural University, Bogor, Indonesia. (In Indonesia).
- [22] Sirajuddin S. N., Hastang., Lestari V. S., and Rosmawaty. (2019a) 'Livestock ecology research on institution and traditional sharing systems in cattle farms', *EurAsia Journal BioSciences*, Vol. 13 No. 1, pp. 239-244.
- [23] Sirajuddin, S. N., Hastang, Lestari VS, and Rosmawaty. (2019b) 'The implementation of a profit-sharing system between beef cattle farmers and the Maiwa Breeding Centre in Enrekang, South Sulawesi, Indonesia' in *IOP Conference Series: Earth Enviromental Science*, 2019, 260(012001).
- [24] Sodiq A. (2010) 'Goat farming pattern and their productivity in the area of eks-Karesidenan Banyumas', *Central Java Agripet*, Vol. 10 No. 2, pp. 1-8.
- [25] Soekartawi. (2003) *Economic theory of production with the subject matter analysis of Cobb-Douglas*. PT. Raja Grafindo Persada, Jakarta. (In Indonesia).
- [26] Suwarta, F. X., and Harmoko G. (2009) 'Analysis of sheep marketing from farmer level to satay seller

in Sleman regancy', *Jurnal Sains Peternakan*, Vol. 7 No. 1, pp. 25-29. (In Indonesia).

- [27] Tunggal, A. W. (2008) *The basic of logistic and supply chain management*. Penerbit Harvarindo, Jakarta. (In Indonesia).
- [28] Wiguna, A. (1984) *Analysis of marketing margins of cow's milk in Boyolali, Central Java*. Unpublished Master Thesis, Gajahmada University, Yogyakarta, Indonesia (In Indonesia).
- [29] Yasin, S., and Dilaga, S. H. (1993) *Bali cattle farms and its problems*. Bumi Aksara, Jakarta. (In Indonesia)